

Claims

1. A winding or rewinding machine to wind a web material (N) and form a roll (R) around a winding spindle (13; 45; 103), comprising: at least a roller (5; 73; 109) in contact with said winding spindle in the initial phase of winding the web  
5 material around the spindle; a transverse cutting element (19; 69; 117) to cut the web material at the end of winding one roll and form a initial free end to wind a subsequent roll around a new winding spindle, said initial free end being inserted between said roller and said winding spindle, characterized in that a least an electrostatic bar (21; 71; 131) is provided to electrostatically charge the web  
10 material and in that said roller (5; 73; 109) in contact with the spindle is made at least partially of non-electrically conductive material.

2. Machine as claimed in claim 1, characterized in that said roller (5; 73; 109) comprises a cylindrical wall made completely of non-electrically conductive material.

15 3. Machine as claimed in claim 1 or 2, characterized in that said roller is a winding roller (5; 109) which remains in contact with the roll (R) being formed around said spindle substantially for the entire winding cycle of the roll.

20 4. Machine as claimed in claim 1, 2 or 3, characterized in that it comprises two winding rollers ((3, 5) forming a winding cradle (7) in which said winding spindle (13) is inserted and on which said roll is formed, at least one (5) of said winding rollers being formed at least partially in non-electrically conductive material.

25 5. Machine as claimed in claim 4, characterized in that said electrostatic bar (21) and said transverse cutting element (19) are mounted on an assembly (17) oscillating around the axis of the first (3) of said winding rollers (3, 5), at least the second (5) of said winding rollers being made at least partially of non-electrically conductive material.

30 6. Machine as claimed in claim 4 or 5, characterized in that the web material is fed to the winding cradle (7) passing along a path that crosses a nip formed of said two winding rollers (3, 5).

7. Machine as claimed in claim 3, characterized in that it comprises a support (43; 101) for said winding spindle (45; 103), said winding spindle and said

roll being formed around said spindle being maintained in rotation by said winding roller (51; 109), around which the web material is driven.

8. Machine as claimed in claim 7, characterized by a moving assembly (67) carrying said transverse cutting element (69) and said electrostatic bar (71),  
5 said assembly oscillating around an axis parallel to the axis of rotation of said winding roller (51) to cut the web material and fasten the web material around said winding spindle.

9. Machine as claimed in claim 7, characterized by a moving assembly (115) carrying said transverse cutting element (117) and said electrostatic bar  
10 (131), said assembly performing a complete rotation around an axis parallel to the axis of rotation of said winding roller (109) to cut the web material and fasten the web material around said winding spindle.

10. Machine as claimed in claim 8 or 9, characterized in that said moving assembly (67; 115) carries a pair of guiding rollers (80, 81; 125, 127).

15 11. Machine as claimed in claim 10, characterized in that said transverse cutting element (117) is positioned between said guiding rollers (125, 127) carried by said moving assembly (115).

12. Machine as claimed in claim 1 or 2, characterized in that it comprises a support (43) for said winding spindle (45), a winding roller (51) in contact with  
20 said roll to maintain the roll in rotation while it is being formed, a moving assembly (67) carrying said electrostatic bar (71), said cutting element (69) and said roller (73) formed at least partially in non-electrically conductive material.

13. Machine as claimed in claim 12, characterized in that said roller (73) formed at least partially in non-electrically conductive material is provided with a  
25 movement in relation to the moving assembly which draws it towards and moves it away from the winding spindle.

14. Machine as claimed in claim 13, characterized in that said moving assembly (67) carries a first actuator (79) to operate said transverse cutting element (69) and a second actuator (77) to draw said roller (73) towards and move it away from the winding spindle.  
30

15. Machine as claimed in one or more of the previous claims, characterized in that said roller formed at least partially in non-electrically

conductive material has a cylindrical surface constituted by a reinforced synthetic material.

16. Method to produce rolls of web material wound around winding spindles, comprising the phases of:

- 5     • winding a first roll of web material around a first winding spindle;
- bringing a second winding spindle in contact with the web material;
- cutting the web material, in proximity to said second winding spindle to form an initial free end and a final free end of web material;
- winding the initial free end of the web material around said second spindle  
10         and starting to wind a second roll, said web material being retained, in proximity to said initial free end, between said second winding spindle and said roller;

characterized in that said roller is made in non-electrically conductive material.

17. Method as claimed in claim 16, characterized in that said roller in  
15         non-electrically conductive material is a winding roller, said rolls being wound with a peripheral winding system.

18. Method as claimed in claim 16 or 17, characterized by cutting the web material before inserting the free end between said second spindle and said roller in non-electrically conductive material.

20         19. Method as claimed in claim 16 or 17, characterized by engaging the web material between said second winding spindle and said roller before cutting the web material.